Space Weather Forecast

Issued on Thursday, 13 July 2023 at 13:22 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Moderate flares likely (R1-R2 Blackouts). Chance of G1/Minor Storms day 1-2 (13-14 Jul).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low with only common class flares observed, the strongest from the large sunspot in the northeast disc. This has produced a number of common class flares in the period, and has the potential to produce stronger flares, with some complexity apparent in its complex trailer spot. A further large sunspot in the southern centre disc, is a more mature spot and consequently much less active. This does have some potential instability however, with slight complexity to its magnetic structure and given the strong magnetic field associated with this region, there is a potential for Moderate or perhaps low level Strong flares if this was to flare. The other regions are generally smaller, simpler and stable and giving at total of eight regions on the disc. No Earth-directed CMEs (coronal mass ejections) were observed.

Solar Wind / Geomagnetic Activity: The solar wind was at background speeds, between 290-350 km/s. The total magnetic field strength has been weak to moderate throughout, whilst the north-south component was also weak. Geomagnetic activity has been at Quiet levels throughout (Kp 0-2).

Energetic Particles / Solar Radiation: No solar radiation storms were observed with the count rate of energetic particles (high energy protons) at background.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate to Low activity expected, with an ongoing likelihood of Moderate class fares and a slight chance of isolated Strong class flares.

Solar Wind / Geomagnetic Activity: There are two potential CME arrivals, however both are low confidence. The first would be the late arrival of a CME from the 10 Jul, which was anticipated 13/0600 UTC, but has yet to be observed. This is likely to be followed by a further glancing arrival around 14/1600 UTC from the filament eruption off the south disc on the 11 Jul. The bulk of this CME is expected to miss, however a glancing impact is possible. Earth is also likely to connect to the fast wind of from a small coronal hole either late day 1 or day 2 (13-14 Jul), although the strength of this connection is also uncertain. This results in a low confidence geomagnetic forecast. Quiet conditions at first are likely to become Unsettled to Active, with a chance of G1/Minor Storms, especially with any CME arrivals. Activity then easing day 3 onward to mainly Quiet with Unsettled spells.

Energetic Particles / Solar Radiation: Solar radiation has a slight chance of reaching the S1/Minor Storm threshold through the period, should a larger flare occur.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	30	30	10	1
Strong	G3	No	1	5	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	70	70	60	60
Very Active	R3 to R5 X	No	15	15	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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